Info Note

Livelihood sources in Climate-Smart Villages of Nyando Basin, Kenya

Findings from a climate-smart agriculture survey in Nyando Basin, Kenya

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Key messages

- In male-headed households, the primary occupation of household heads is crop farming, while the spouse(s) do casual work and other off-farm income-earning activities.
- On-farm income-earning activities comprise of crop farming at 43% and livestock production at 40.9%.
- 96% of the households work full-time on the farms, 1% part-time, 2% occasionally, and 1% do not engage in farm work.

This brief summarizes findings of the research project "Using Climate-Smart Financial Diaries for Up-scaling in Nyando, Western Kenya", a project led by the Amsterdam Center for World Food Studies (ACWFS) with participation of the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) in East Africa, the University of Nairobi's School of Economics and Wageningen Economic Research. The findings are based on baseline data of an on-going bigger panel study involving 122 households located in the Climate-Smart Villages (CSVs) and a few non-CSVs in Nyando. The villages have similar characteristics in terms of climate, soils and main agricultural practices. They occupy the Nyando Basin and cut across Kisumu and Kericho counties. The project focus is assessing the financial inflows and outflows of households in these villages by gathering data on their income, consumption, savings, lending and investment patterns.

Overview of the climate-smart agricultural farms in Nyando Basin

CCAFS, together with partners, has been initiating climate-smart agriculture (CSA) interventions since 2011 in Nyando aimed at improving farming and household financial lives. This was after several years of repeated floods and droughts that rendered the majority of the small-scale farmers dependent on government and Red Cross donations of food, blankets and shelter. The program aims to increase adoption of climate-smart technologies by offering trainings, inputs (improved seeds and fertilizer) and cash incentives (innovation funds for borrowing in table banking within groups of poor farmers). Benefiting households are those participating in group activities. The group members operate greenhouses, apiaries and help each other to construct water catchment pans. CCAFS donated Galla goats for local breed upgrade. To qualify for the program, households had to meet at least one of the following five eligibility criteria:

- Membership to a CSV and participation in group activities as per identified CSA practice;
- Ownership of improved sheep/goats;
- Land management practices and crops planted by household (low/high) – high adoption crop management entailing use of improved seeds, fertilizer and pesticides, however on a lower scale households did not burn, introduce intercropping, ridges or bunds, terraces, hedges, with few planting a number of trees per acre, in past 10 years;
- Belong to a household that derives its living from activities within on-farm, off-farm, business, employment/salaried income; or,
- Belong to a household that derives its living from crop, livestock or a combination of the two agricultural systems (Bernier 2015).

CCAFS operations have managed to upscale the various CSA interventions across Nyando Basin

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areas offering support in forms of inputs. These CSA approaches include agroforestry, Galla goats/Red Maasai sheep, greenhouses and water catchments which have built resilience as mitigation measures to curb climate change and related shocks.

Table 1: Demographic characteristics of CSA adopters and non-adopters

Variable	Adopters (n=90)	Non-adopters (n=32)	Difference
	Mean	Mean	
Age	54	53	1
Dependency ratio	1.17	1.2	0.03
Household size	6	6	0
Distance to motorable road(km)	0.59	0.75	0.16
Distance to food market (km)	2.96	3.28	0.32
Distance to livestock market (km)	8.79	8.98	0.19
Gender of the household head (% of male headed)	84	71	13
Off-farm occupation (% of households with off-farm)	39	41	0.02
Saving decision (proportion of persons who saved)	70	50	20**
Access to extension services (% of persons accessed)	79	57	22**
Access to credit	62	51	11

*** 1% level of significance, ** 5% level of significance and *10% level of significance

The outcome variables examined in this baseline study include a range of household and individual-level variables (including gender, age, off-farm occupation, distance to motorable road, food and livestock market, saving decisions, credit access, extension services, group membership and asset ownership). The range of outcomes chosen goes beyond the conventional procedures used to evaluate factors associated with the likelihood of adoption of a wide range of CSA interventions and is broadly comparable with those used in the Working Paper No. 79 on Gender and Institutional Aspects of Climate-Smart Agricultural Practices (Bernier et. al 2015).

As shown in Table 1, the differences in all but four of the outcomes are below one between CSA adopters and non-adopters. This means that their effect on all farmers is similar. Only two of these changes (saving decisions and access to extension services) are statistically significant. In this study, access to credit had a positive effect on household resilience. Over 40% of those having access to credit received it from table banking groups. The most cited group source was savings and internal lending from community-based organizations (CBOs) popularly known as an innovation fund which is a table banking model introduced by CCAFS to enhance the culture of saving, borrowing and investment to other smaller groups. About 51% of CSA adopters access credit from groups, formal banks and micro-finance institutions, family, friends and relatives and through mobile money platforms compared to 46.7% of non-CSA adopters. Credit helps in availing the capital needed to undertake investments and thus facilitate the application of innovative practices. According to Mulwa et al. (2015), access to credit had a positive influence on many farm practices such as water and soil conservation practices besides access of drought-tolerant crop varieties. Saving decisions of households facilitate access to credit. 57% of CSA adopters save in CBOs, self-help groups, micro-finance institutions such as Kenya Women Finance Trust (KWFT) and banks compared to 40.9% of non-CSA adopters. Increase in awareness for future security of unforeseen shocks, such as sickness, death of a family member, financial crisis and weather-related risks have made farmers inclined to savings (Sethi 2013). There was a 22% difference in favor of adopters for individuals who accessed extension services. Access to extension training and advice has a positive influence in building household resilience. Extension advice raises farmers' awareness on issues that affect them such as climate-related shocks and land constraints and ways through which the shocks can be mitigated and thus have a positive effect on household resilience. Maguza–Tembo et al. (2016) and Mulwa et al. (2015) also found that extension advice augments local knowledge and facilitates adoption of various farm management practices.

Distances (in km) to motorable road, livestock and food markets have an insignificant influence on participation in the program. Dependency ratio is slightly higher for non-adopters than adopters while household sizes remain the same at six members for the two groups.

On the individual-level outcomes, Figure 1 shows household heads' main primary occupation to be crop farming, while the spouses are mainly casual workers at off-farm engagements such as basket/rope weaving, making doughnuts, sales persons, charcoal vendors and tending to household chores. They also practice livestock farming and engage in on-farm casual labor more than household heads.

A typology of livelihood sources for low-income CSA farmers

Figure 1 shows household heads primary occupation is crop farming, while spouses do casual work off-farm, such as basket/rope weaving, making doughnuts, selling solar panels on commission, charcoal selling and household chores. Spouses also attend to livestock and on-farm chores.

The mainstay of the majority of household heads and spouses as indicated in Figure 1 is on-farm crops (46.69%) and livestock production (47.75%),

respectively. Main crops grown in the Kisumu side of Nyando sub-county are maize, beans, sorghum, millet, cassava and groundnuts. On the Kericho side maize, beans, sorghum, millet and sugarcane are the main crops grown. Planting early maturing crop varieties and the use of fertilizers has enabled farmers to increase productivity and cope with climate change/variability. The surplus produce is sold thus earning the household income and enhancing the overall household resilience. In both areas, the majority of livestock are indigenous breeds of cattle, chicken, sheep and goats. Planting early maturing crop varieties and use of fertilizers has enabled farmers to increase productivity and cope with the vagaries of weather. Surplus produce is sold thus earning the household income and contributing positively to overall resilience. Sheep and goats are commercial animals that are only rarely domestically consumed as food-protein sources.

An important livelihood diversification strategy for the majority (75%) of respondents is casual on-farm or off-farm work and starting small businesses when unexpected shocks occur at the household level. Unlike the subsistence farmers, salaried respondents have an easier time saving for a business or accessing loans using their pay slips as collateral to start a business for increasing and/or stabilizing household earnings.

Businesses are particularly important for the spouses of respondents as indicated in Table 1. In addition to diversifying the household's overall earnings, they also help, especially women, to supplement household's budget and afford them some independence in financial decision-making. Slightly more (41%) non-adopters engage in off-farm employment as compared to 39% of adopters of CSA. These off-farm engagements consist mostly of very low investments in small scale trading. They start and stop frequently, depending on household needs and the availability of working capital. They include enterprises such as basket/rope weaving, making doughnuts/*mandazi*, selling dried or deep-fried fish, selling solar panels on commission, selling charcoal and secondhand clothes (*mitumbas*). They are very helpful for the poor, providing small boosts to household income that help a family deal with hunger, economic risks and unexpected shocks.

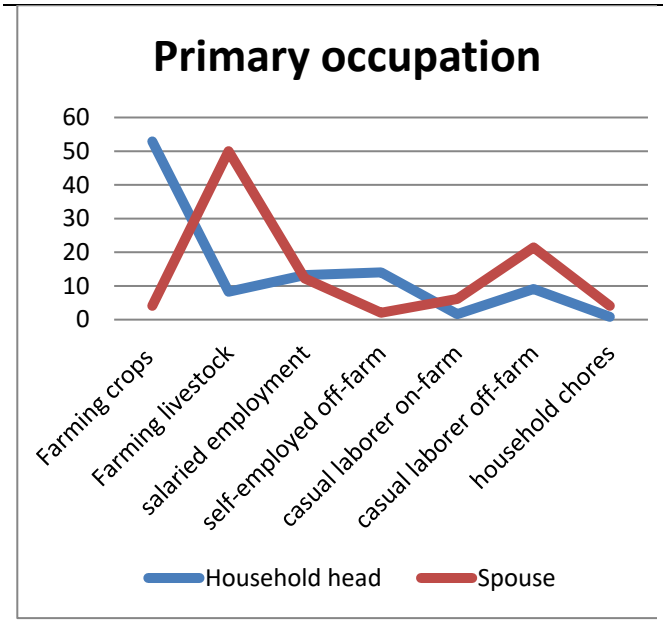

Figure 1: Primary occupation of respondents

Labor contribution to primary occupation

Figure 2 shows that the majority (96%) of respondents work full-time on their primary occupation, 1% work part time, 2% work occasionally and 1% are not working. The last two categories have access to loans, remittances, retirement benefits and employ workers/laborers to manage and oversee their primary occupation, mainly farming and transport business, due to other engagements such as employment, old age or poor health. However, over 75% of smallholder CSA farmers seek casual on-farm and off-farm jobs from large holder farms on a part-time basis to supplement their incomes.

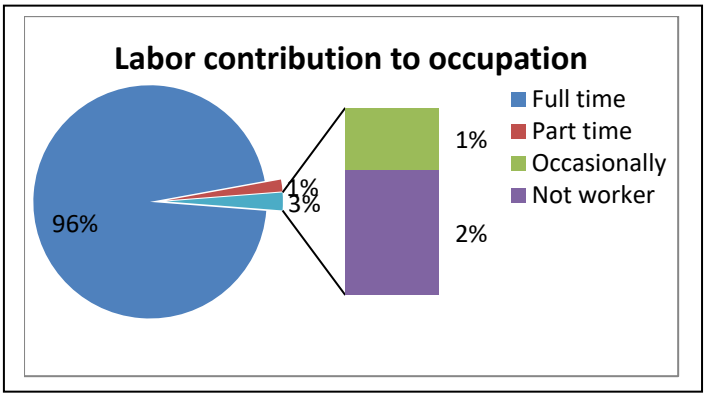

Figure 2: Labor contribution to primary occupation by respondents

Conclusions and policy implications

The interventions of CCAFS have had a positive impact on households' resilience, saving decisions, credit and extension service access. These findings disapprove conclusions of the earlier baseline report (Bernier et al. 2015) that extension had no impact on awareness and

adoption of improved agricultural practices in Nyando. However, on the other hand, it concurs that improved income access through awareness initiatives put forward have not led to an impact on uptake of CSA practices and farmers have partially supplemented agricultural activities (seen as risky) with off-farm businesses. Group saving decisions mainly have a positive impact on adoption of CSA. Farmers receive annual saved cash shares which serve as re-investment in high cost improved farming techniques like water catchments and greenhouse installations.

Overall, however, the CSA technologies adoption achieved through CCAFS are declining slightly given the time lapse and farmers dynamic preferences. Probable solutions for consideration could be up scaling technologies mostly favored by farmers by region, doing away with non-performing technologies and introducing new ones preferred by farmers. It would be timely to review the program's mechanism to target financial institutions to lend farmers cash and introduce insurance packages to cushion against risks from shocks experienced by the poorest households. If this could be done, CSA technologies and practices still have great potential to interrupt the shocks from climate change of millions of poor farmers in Kenya.

Further reading

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